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Understanding Tendencies of Aggressive Behavior and Cognition as Related to Alcohol Use and Intimate Partner Violence

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Understanding Tendencies of Aggressive Behavior and Cognition as Related to Alcohol Use and Intimate Partner Violence

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ABSTRACT

The term intimate partner violence (IPV) refers to any act of aggression (physical or emotional) committed within an intimate relationship by one partner against the other, regardless of gender, sexual intimacy, or sexual orientation. One of the leading risk factors for IPV is the regular abuse of alcohol (National Coalition Against Domestic Violence, 2014). High levels of alcohol consumption predict an increase in aggression in individuals with aggressive dispositions (Barnwell et al., 2006). Extensive research exists on the relationship between alcohol use and IPV, yet there is a dearth in the literature investigating the complexities of the alcohol use-IPV relationship with automatic aggression- and alcohol-related cognition as mediating factors. The current study sought to investigate these relationships in a sample of 126 college students (M_{age} = 19.66; *SD* = 1.46) who were characterized as "social" drinkers (based on the AUDIT screening questionnaire). Correlational analyses revealed a significant relationship between problem drinking and forms of IPV (e.g., sexual coercion and physical assault), as well as between problem drinking and anger as a form of aggression. Results revealed that the strength of negative attitudes associated with violence was relative to the context in which it is being evaluated (e.g., alcohol or recreational behaviors). Furthermore, we were unable to find a significant mediated link between problem drinking and IPV with aggressive tendencies as the mediator. These findings elucidate the complex relationships between cognitive processes, aggressive dispositions, problematic alcohol use, and IPV. Implications, limitations, and future directions are discussed.

Key words: *intimate partner violence (IPV), problem drinking, alcohol use, implicit cognition, Go/No-Go Association Task (GNAT), aggression*

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Understanding Tendencies of Aggressive Behavior and Cognition Related to Alcohol Use and Intimate Partner Violence

According the 2010 National Intimate Partner and Sexual Violence Survey, more than one third of all women in the United States have experienced a form of intimate partner violence (IPV) at some point in their lives. The same holds true for a quarter of all men in the United States (Black et al., 2010). In nationwide face-to-face home interviews of married couples, one out five couples reported having experienced some sort of IPV during their current relationship (Schafer, Caetano, & Clark, 1998). IPV refers to any act of physical, verbal, psychological, or emotional aggression committed within an intimate relationship by one partner against the other, regardless of gender, sexual intimacy, or sexual orientation (Dixon & Graham-Kevan, 2011; NCADV, 2014). IPV almost always results in some sort of physical and/or psychological harm to the victim (Black et al., 2010; Schafer et al., 1998). Women tend to report IPV more frequently and with greater severity than their male counterparts, which has been likened to the occurrence of IPV for women being recurrent or resulting in physical injury or death (Schafer et al., 1998).

Though extensive research exists on the relationship between alcohol use and IPV, little research exists on the relationships between alcohol use and IPV as mediated by cognitive and behavioral factors – specifically, the mediating relationship of an individual's tendencies toward aggressive behaviors. A recent international survey conducted by Graham, Bernards, Wilsnack, and Gimel (2011) found a positive relationship between alcohol consumption and the severity of aggression in regard to IPV

that appears to be consistent across most cultures. Both women and men who have experienced some form of IPV during their lifetime may also subsequently suffer from physical and psychological damages, such as depression, suicide attempts, substance abuse, and sexually transmitted disease (Black et al., 2010). Identification of mediating factors, such as aggressive behaviors and cognitive processes, in the alcohol use-IPV relationship may contribute to the improvement of general public health by elucidating underlying causes and thereby potentially leading to new prevention and treatment measures. Therefore, the purpose of this current study was to further the research on the relationship of IPV and alcohol use, including the mediating role of aggressive behaviors and aggressive-related and alcohol-related cognitions.

Aggression and Alcohol Use

Previous research has found that alcohol consumption and alcohol-related expectancies (i.e., the beliefs people hold regarding the effects of alcohol) are positively correlated with aggressive tendencies (Batholow & Heinz, 2006; Borders, Barnwell, & Earleywine, 2007; Freidman, McCarthy, Bartholow, & Hicks, 2007; Pabst et al., 2014; Subra et al., 2010; White et al., 2013). For instance, Subra et al. (2010) concluded that alcohol-related priming cues triggered the same amount of aggression as did aggression-related priming cues. In this study, participants were randomly assigned to be primed with either alcohol-related cues or aggression-related (i.e., weapon-related) cues and were measured on their reaction time to aggressive cues. The results showed that alcohol-related cues were just as effective in increasing aggression as were aggression-related cues. Likewise, White et al. (2013) examined alcohol expectancies, dispositional hostility, and alcohol consumption as possible predictors of alcohol-related violence. In

this longitudinal study self-report measures were used to evaluate drinking habits and aggressive tendencies in a group of boys (ages 13-18) at six month intervals over the course of fourteen years. White and colleagues (2013) found that individuals who endorsed beliefs that alcohol use increases the expression of aggression also demonstrated an increase in alcohol-related aggression over time. Furthermore, Pabst and colleagues (2014) measured the relationship of alcohol expectancies to prevalence and severity of alcohol-related problems with the consideration of episodic, or infrequent, heavy drinking based on amount of alcohol intake, or consumption, as a potential mediator. Results from this study indicated that individuals with high negative alcohol expectancies were more likely to experiences alcohol-related problems – including higher incidence of violence and injury (Kraus et al., 2009; Kuntsch et al. 2008).

Research findings also highlight a relationship between aggressive personality traits, or dispositions, and aggressive behaviors while under the influence of alcohol. Barnwell, Borders, and Earlywine (2006) found that an aggressive disposition influenced the amount of aggressive behaviors that an individual displayed after alcohol consumption. Aggression was defined as a range of behaviors including acts such as hitting, pushing, verbal threats, and hurtful comments (Barnwell et al., 2006). In a related study, Giancola (2002) investigated dispositional aggression in relation to provoked and unprovoked aggression in a sample of social drinkers. Participants responded to the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 2009) to assess tendencies of dispositional aggression before being administered an alcoholic beverage of a controlled amount. After the alcoholic beverage was administered, participants completed the Taylor Aggression Paradigm (Taylor, 1967) to measure provoked aggression versus non-

provoked aggression. Giancola (2002) found that the relationship between increased alcohol use and higher levels of aggression is not consistent across persons. Specifically, alcohol-related aggression was higher for participants that endorsed high dispositional aggression, but lower for participants that endorsed low dispositional aggression.

Evidence also suggests that cognitive processes involving either alcohol or aggression may lead to an increased strength in aggression-related thoughts. Friedman and colleagues (2007) found that subliminal exposure to alcohol-related words elicited hostility towards a target person when participants demonstrated higher aggression-related alcohol expectancies. Subra and colleagues (2010) investigated the relationship between alcohol and aggression using the automaticity theory of alcohol-related aggression, which suggests that the link between these factors is strong enough that mere exposure to alcohol-related cues activates aggressive thoughts and behaviors. Results from Subra and colleagues (2010) supported this theory. Likewise, results from a study by Bartholow and Heinz (2006) showcased that alcohol-related cues elicited aggressive thoughts. In this study, participants were exposed to a series of alcohol-related images and measured for aggressive thoughts. Exposure to these images increased the accessibility of aggressive thoughts in participants. Bartholow and Heinz (2006) suggested that the concepts of alcohol and aggression could become linked in semantic memory just as, for example, weapon- and aggression-related thoughts are often linked.

A robust body of literature highlights relationships among aggressive personality traits, alcohol use cognition and behavior, and engagement in aggressive acts; however, a pertinent question remains as to whether aggressive tendencies and alcohol use might also be related specifically within the context of IPV.

Alcohol Use and Intimate Partner Violence

IPV is a form of aggression that occurs within the context of a romantic relationship. Within heterosexual relationships, statistics indicate both men and women both report instances of IPV within the relationship (National Coalition Against Domestic Violence, 2014). In a meta-analysis of past research on IPV and alcohol use, Foran and O'Leary (2008) found that, regardless of gender, alcohol was positively correlated with IPV.

Laboratory research assessing cognitive processes related to alcohol and aggression has produced fruitful results. A study conducted by Obasi, Pittman, Mrnak-Meyer, and Brooks (under review) found a positive correlation between cognitions related to alcohol use and interpersonal violence (IPV). This study was one of the first to use an implicit measure of aggression and alcohol—the Go/No-Go Association Test (GNAT; Nosek & Banaji, 2001)—in addition to self-reported measures of alcohol use behaviors and experiences with IPV. This study consisted of two smaller studies, with each using modified versions of the GNAT – an Alcoholic Drinks GNAT and a Violent Behaviors GNAT. Study One used a version of the Alcoholic Drinks GNAT (GNAT-AN) with "alcoholic drinks" being the target category with attributes "good" and "bad." The distractor for "alcoholic drinks" was "non-alcoholic drinks." The version of the Violent Behaviors GNAT used (GNAT-VR) "violent behaviors" as the target category with attributes "good" and "bad." The distractor for "violent behaviors" was "recreational activities." For Study Two, the modified version of the Alcoholic Drinks GNAT (GNAT-AD) was the same as the GNAT-AN except for the distractor ("alcoholic drinks") was changed to "licit and illicit drugs." The version of the Violent Behaviors GNAT (GNAT-

VI) used in Study Two was the same as GNAT-VR except for a change in distractor from "recreational behavioral activities" to "interpersonal intimacy." Obasi and colleagues (under review) concluded that implicit cognitions associated with alcoholic drinks varied depending on the evaluative context (i.e., in contrast to nonalcoholic drinks or drugs) whereas IPV was evaluated negatively throughout, suggesting that IPV-related cognitions are not dependent upon context.

Literature shows alcohol use and intimate partner violence to be positively correlated (Foran & O'Leary, 2008; Obasi, et al., under review); however, this relationship can be influenced by other factors, such as aggression. Moreover, alcohol use may simultaneously have an effect on aggressive behaviors (Foran et. al, 2008). Therefore, this study focused on the influence of alcohol use on the frequency and severity of IPV in the presence of aggressive tendencies.

Alcohol and Implicit Cognition

Paper-and-pencil measures used to gather data on 'explicit,' or self-reported, cognition (beliefs) related to alcohol and IPV are susceptible to participant and research biases. To minimize error caused by these biases, researchers use implicit measures of cognition (as assessed with computer tasks) alongside traditional self-report measures of cognition (Jajodia &Earleywine 2003; Wiers, Woerden, & de Jong 2002). Examples implicit measures include priming techniques (Subra et al., 2010) the Implicit Association Task (Wiers et al., 2002) and the GNAT (Nosek & Banaji, 2001). In theory these computer tasks are programmed such that participants have very little time to respond "intentionally" due to the nature of the task (e.g., time constraints), thus the

possibility of response biases is reduced when assessing potentially taboo topics like substance use and violence.

Over the last two decades, the Implicit Association Task (IAT) has become the gold standard of measuring implicit alcohol-related cognition. In a pioneering study of implicit alcohol-related cognition, Wiers et al. (2002) used the IAT as a measure of alcohol-related cognition in a sample of heavy and light drinkers. As a measure of implicit alcohol-related cognition, the IAT produces a response time based on the speed in which participants respond to the presentation of combinations of stimuli (e.g., *beer* v. *water*) and evaluative attributes (e.g., *good* v. *bad*)–the faster the response times are to stimuli-attribute combination, the stronger the association between the stimuli and attribute are presumed to be. This study found differences in implicit and explicit associations of alcohol for light and heavy drinkers alike. Implicit associations were more negative (i.e., alcohol was strongly associated with '*bad'*), whereas explicit associations were found to be positive (i.e., alcohol was seen more favorably) (Wiers et al., 2002). In a similar study, Jajodia and Earleywine (2003) found heavy drinkers showed strong implicit and explicit associations between alcohol use and arousal. This research suggests that using measures of both implicit and explicit cognitions together – especially when considering the relationship between alcohol use and IPV– can lead to the most comprehensive results (Jajodia & Earleywine, 2003).

An alternative measure of implicit cognitions is the GNAT (Nosek & Banaji, 2001). Like the IAT, the GNAT presents participants with words from one of two categories. Unlike the IAT, the GNAT only requires a response ("*Go*", or a press of the space bar) for words that belong to either category. If the word presented does not

belong, then the participant does not respond ("*No-Go*"). The GNAT allows for the observation and measurement of individual factors or contextual differences and is able to provide results similar to the IAT (Wiers et al., 2002) without the necessity for starkly contrasting categories (e.g., alcoholic v. nonalcoholic beverages; Nosek & Basaji, 2001). While this is a relatively new measure of implicit cognition, unpublished data conducted by Obasi and Brooks in separate labs provides evidence in support of this as a measure of alcohol-related and aggression-related implicit cognition comparable to the IAT.

Aims

IPV and alcohol use is an issue worldwide – as highlighted by Graham, Bernards, Wilsnack, and Gimel (2011) in their international survey showing alcohol use as a causal factor of aggression related to severity of IPV. Society as a whole may benefit from the results of this study, as it contributes to the knowledge base on the relationship between IPV and alcohol use.

Aim 1. The purpose of this study was to further the research on the relationship of IPV and alcohol use, considering the additional factor of aggressive tendencies as a potential mediator.

Hypothesis 1.1. Based on previous research, such as that of Jajodia and Earleywine (2003) and White and Chen (2001) who found that problem drinking significantly predicted the incidence of IPV perpetration and victimization, it is proposed that higher problem drinking scores would be positively correlated with higher amounts of IPV.

Hypothesis 1.2. Based on the work of Graham et al. (2011), who assessed the severity of partner aggression across thirteen different countries and found that the significance of the relationship between alcohol use and IPV was consistent across cultures, we hypothesized that higher scores of aggressive tendencies, as measured by the BPAQ (Buss & Perry, 2009), along with problem drinking, as assessed by the AUDIT (Saunders, Aasland, Babor, De La Fuente & Grant, 1993) would be linked to IPV.

Aim 2. Though there has been extensive research on the relationship between alcohol use and IPV, research on the relationship of alcohol use and IPV considering aggression as a mediating factor is scarce. The research that exists has focused primarily on explicit measures of cognition. It has been proven that using explicit measures alongside implicit measures provides for the most comprehensive results within a study (Jajodia et al., 2003; Wiers et al., 2002). The current study investigated the relationship between alcohol use and IPV as mediated by tendencies of aggressive behaviors through the use of implicit measures, two versions of the GNAT (Nosek & Banaji, 2001), as well as explicit measures of aggressive behavior.

Hypothesis 2.1. It was expected that high scores on measures of aggressive tendencies, along with problematic alcohol use, would be positively correlated with an increased experience of IPV for both males and females in an intimate relationship. This hypothesis is rooted in findings that indicate that, while females reported IPV with greater frequency and severity than males (Graham et al., 2004), both women and men experience IPV.

Hypothesis 2.2. It was also predicted that there would be negative implicit attitudes associated with violence, regardless of the context in which it was presented and evaluated.

Method

Participants. A total of 126 participants completed this study. Control items were included in the self-report measures to ensure vitality of data. Individuals who failed to correctly respond to any of the five control items were removed from data analysis (N = 11). The remaining participants (N = 115) consisted of college students (male: *n* = 22, 34.40%; female: *n* = 42, 65.60%). College freshman (*n* = 18, 53.10%), sophomore (*n* = 21, 32.8%), junior (*n* = 19, 29.70%), and senior (*n* = 6, 9.40%) students participated in this study in order to partially fulfill a course credit or in order to obtain extra credit for the undergraduate psychology course in which they were enrolled at Georgia Southern University. Participants were recruited via the sampling of an online subject pool through the SONA system.

Age of participants ranged from 18 to 26, with an average of 19.66 (*SD* = 1.46). Self-reported ethnicity was White/Caucasian (*n* = 39, 60.90%), Black/African-American (*n* = 19, 29.70%), Hispanic/Latino (*n* = 1, 1.60%), Asian/Asian American (*n* = 3, 4.70%) and "other" (*n* = 2, 3.10%). Participants' self-reported relationship status ranged from single (*n* = 34, 53.10%), dating (*n* = 13, 20.30%), in a serious relationship (*n* = 16, 25.00%), to engaged to be married (*n* = 1, 1.60%). No participants reported being married or divorced. Self-reported sexual orientation of participants was heterosexual (*n* = 61, 95.30%), homosexual (*n* = 1, 1.60%), and bisexual (*n* = 2, 3.10%).

Design. This study involved a correlational design that investigated implicit and explicit cognitions associated with the relationship of IPV and alcohol use behaviors. Aggressive behaviors were explored as a potential mediating factor. This portion of the study

involved self-report questionnaires to measure explicit cognitions related to aggression and IPV. Implicit cognitions were measured using an experimental within-subjects design.

Measures

Demographics Questionnaire. All participants received a brief demographics questionnaire that assessed the characteristics of each individual who completed the study. Demographic questions included age, race/ethnicity, sexual orientation, self-identified religion, and gender.

Problem Drinking. Problem drinking was assessed with a 10-item questionnaire developed by the World Health Organization. The Alcohol Use Disorders Identification Test (AUDIT) (Saunders et al., 1993) screens for individual risk of alcohol-related problems. This survey assesses frequency of drinking, as well as other alcohol-related problems on a Likert-type rating scale. The items are scaled ranges from 0 – 4 with 0 representing "*Never*" or "*No*" and 4 representing "*Daily or almost daily*" or "*Yes, during the last year*" (Saunders et al., 1993). A score equivalent to 8 or higher is indicative of problematic drinking behavior; scores of 13 for women and 15 for men indicate likely alcohol dependence. The AUDIT has demonstrated relatively sufficient internal consistency in the literature ($\alpha = .65$; Saunders et al., 1993). In the current study, the AUDIT was observed to be internally reliable ($\alpha = .83$).

Intimate partner violence (IPV). IPV was measured using a modified self-report version of the Revised Conflict Tactics Scales (CTS2; Straus, Boney-McCoy, & Sugarman, 1996). This measure allows for the measure of the amount (prevalence) and

severity (chronicity) of the IPV experienced by and perpetrated by the participant. Though this scale is capable of measuring conflict within sibling relationships and parent-child relationship (Straus et al. 1996), it was used only to measure conflict within intimate romantic relationships within the current study. Participants responded to items depending on how often he or she had experienced or perpetuated aggression within the past month (e.g., "Insulted or swore at my partner'). Rating of experiences was through a Likert-type scale: 0 ('*Never'*), 1 ('*One time'*), 2 ('*Two times'*), 3 ('*Three to Five times'*), 4 ('*Six to Ten times'*), 5 ('*Eleven to Twenty times'*), and 6 ('*More than Twenty times'*). The CTS2 consists of five subscales – negotiation (α = .86), psychological aggression (α = .79), physical assault (α = .86), injury (α = .95) and sexual coercion (α = .87) (Straus et al., 1996), four of which were used in the current study and demonstrated excellent internal validity—psychological aggression (α = .95), physical assault (α = .99), injury (α = .99), and sexual coercion (α = .99).

Aggressive tendencies. A modified version of the Aggression Questionnaire developed (BPAQ) by Buss and Perry (1992) was used to assess aggressive behavior in participants. This self-report questionnaire consists of 29 items that assess four factors of aggression, including: 'Physical Aggression' (e.g., '*I have become so mad that I have broken things'*) (α = .85), 'Verbal Aggression' (e.g., '*I often find myself disagreeing with people'*) (α = .72), 'Anger' (e.g., '*I have trouble controlling my temper*') (α = .83), and 'Hostility' (e.g., "*When people are especially nice, I wonder what they want*') (α = .77) (Buss & Perry 1992). Participants were asked to respond on a Likert-type scale ranging from 1 ("*Not at All*") to 5 ("*Completely*"), with 3 ("*Unsure*") being the midpoint (Tsorbatzoudis, Travlos, & Rodafinos, 2013). In the current study, all portions of the

Aggression Questionnaire demonstrated adequate internal reliability (Physical Aggression: α = .70; Verbal Aggression: α = .76; Anger: α = .69; Hostility: α = .83).

Implicit measure of aggression-related cognition. All participants completed two modified versions of the GNAT (Nosek & Banaji, 2001), a computer program that is designed to measure implicit cognition. The GNAT is able to measure information on implicit cognitions as related to an individual category without the use of such starkly contrasting categories as required by the IAT. In each trial within the GNAT, a target category (e.g., *alcohol, violence*) is presented along with attribute (e.g., *good, bad, safe, dangerous*) and distractor (e.g., *non-alcoholic beverage, intimacy, non-violence*) categories. The GNAT is able to measure the strength of the association between target category and the attribute (i.e. *sensitivity*). Sensitivity is defined as the degree to which the target is associated with the attribute based on accuracy of responses (appropriately responding or 'going' to target stimuli, and inhibiting a response or 'not-going' to distractors) (Nosek & Banaji, 2001).

The GNAT requires participants to respond to one or two targets and attributes as related to a specific context (distractors) with either a "*Go*" or "*No-go*" response. A "*Go*" response involves pressing the designated key (spacebar) if the stimuli match both the target category (e.g. *alcohol*, *violence*) and the attribute (e.g. *intimacy*, *non-violence*). For a "*No-go*" response, participants withhold a response to the stimuli (distractors) presented if the stimulus does not match either target or attribute categories.

The GNAT (Nosek & Banaji, 2001) was chosen over the IAT (Wiers et al., 2002) because it allows for the observation of implicit cognitions without the need for harshly

contrasting categories (e.g., *black* v. *white*), and is useful when such contrasting categories are unapparent or do not exist. The GNAT is able to account for the potential influence of "context," that is, the circumstances in which a particular target is being evaluated. For example, the racial targets '*African-American'* versus '*White'* may elicit a different response than '*African-American'* versus '*Asian-American.'* Therefore, it might be difficult to assume that the strength of implicit cognitions observed in relation to '*African-American'* was not due to the contrasting of either of those specific concepts ('*White*' or '*Asian-American*'), rather than in direct relation to the concept of *'African-American'* itself (Nosek & Banaji, 2001).

For this experiment, the original GNAT presented in Nosek & Banaji (2001) was modified to focus on implicit cognition associated with IPV, alcohol, and aggressive behavior. Two versions of the GNAT were used–one involving the categories of violence and alcohol and the other examining the categories of violence and recreational behaviors. For the Violence-Alcohol GNAT (GNAT-VA), the target categories included alcoholic beverages (words such as *liquor, margarita, beer, brandy*) or violent behaviors (words such as *burn, shoot, slap, rape*) with the attributes being either negative (words such as *bad, unpleasant, destroy*) or positive (words such as *pleasure, happy, likeable*). The second GNAT was modified to include target categories of violent behaviors (words such as *burn, shoot, slap, rape*) or recreational behaviors (words such as *swimming, hiking, yoga, painting*), with the attribute either being negative or positive. One trial, for example, included the target category '*violent behaviors*' and the attribute '*negative'*.

Both the general target and attribute categories appeared simultaneously on the computer screen in the upper right-hand and upper left-hand sides of the screen,

respectively. The target category appeared in all capital letters (e.g., '*BURN'*) and the attribute appeared in all lower case letters (e.g., '*horrible'*) (see '*Appendix E'* for a sample screenshot of the computer task). Target, attribute, and distractor word stimuli were individually presented in the middle of the screen at various speeds based on block number (i.e. 600ms/1000ms response deadlines), changing randomly with each subsequent trial. Participants responded to the stimuli by pressing the spacebar (a "*Go*" response) if it was associated with either of the two categories at the top of the screen – the target or attribute. If the stimulus presented in the middle of the screen was unrelated to either the target or the attribute category within the block, then the participant inhibited a response (a "*No-go*" response) until a new stimuli was presented (after 600ms or 1000 ms).

Procedure

All experiments were conducted in the AMP Health Laboratory room located on Georgia Southern University's campus. Participants were informed of the nature of the study followed by the completion and signing of informed consent. Each participant was assigned to sit at one of three computer stations. Participants received instructions to work individually for the duration of the experiment session.

Each participant received all sections of the questionnaire portion of the study, including the AUDIT (Saunders et al., 1993), the CTS2 (Straus et al., 1996), the BPAQ (Buss & Perry, 2009), and the demographics questionnaire. The questionnaire portion of the study was administered using the computer program MediaLab version v2014. All

questionnaires were presented in random order to each participant, with exception to the demographic questionnaire, which was completed by each participant last.

All participants were asked to complete the both versions the modified GNAT (Nosek & Banaji, 2001). Both GNATs were administered using the computer software INQUISIT 4. Before beginning the GNAT tasks, participants completed a trial run to become accustomed to the operation of the computer program. Participants then completed two versions of the GNAT (counterbalanced in order administered). At the conclusion of the study, participants were debriefed to the extent necessary and thanked for participation.

Results

Correlational Analysis

The current sample (N = 115) can be characterized as not engaging in risky drinking practices (AUDIT: M = 6.05, SD = 6.03). Mean scores for this sample for verbal aggression was M = 13.21 (SD = 4.66), with possible scores ranging from 5 – 25 in comparison to the original study (M = 15.20, SD = 3.90; Buss & Perry, 1992;). Mean score for hostility were slightly lower with a M = 19.98, SD = 7.81, with scores ranging from 5 – 40, compared to original data from Buss and Perry (1992) (M = 21.30, SD = 5.50). Mean scores for physical aggression, which ranged from 5 – 45 (M = 22.51, SD = 7.00), were also lower in comparison to the original Aggression Questionnaire (Buss & Perry, 1992; M = 24.30, SD = 7.70). Mean scores of anger on a scale of 5 – 35 (M = 17.35, SD = 5.77) were similar to the mean scores of anger in the original Aggression Questionnaire (Buss & Perry, 1992; M = 17.00, SD = 5.60). The total score for aggression for the current sample was a score of on 73.05 a scale of 29 – 145 in comparison to the original study (M = 90.88; Buss & Perry, 1992).

Many of the variables were correlated, most notably: problem drinking and sexual coercion (r = .51, p < .001), problem drinking and physical assault as a form of IPV (r = .51, p < .001), problem drinking and anger as a form of aggression (r = .29, p < .001), and problem drinking and physical aggression (r = .31, p < .001).

Implicit Aggressive-Related Cognition

Correlational analyses revealed a statistically significant relationship between problem drinking (AUDIT) and negative implicit attitudes toward alcohol in the context

of violence (r = -.12, p < .05). To determine the differences in sensitivity (d'prime) on the Violence-Alcohol and Violence-Recreation GNATs, a series of t-tests were conducted . When 'Recreational Behaviors' were the distractors, participants showed greater sensitivity when Violence and Bad (d' = 1.41) were signals than when Violence and Good were signals (d' = .60), $t(136) = 12.85$, p = .000. Likewise, when the background noise was 'Alcoholic Beverages,' participants demonstrated higher sensitivity when 'Violence' and 'Bad' (d' = 1.22) were signals than when 'Violence' and 'Good' were signals (d' =.72), $t(138) = 8.17$, p < .001. Participants showed a greater sensitivity to 'Violence' and 'Bad' in the context of 'Recreational Behaviors' (d' = 1.41) than 'Violence' and 'Bad' in the context of 'Alcoholic Beverages' (d' = 1.22 , $t(136) = -2.80$, p < .01). This finding suggests that the context in which violence is presented, that is, when the distractors were alcoholic beverages or recreational behaviors, affected the strength of negative attitude associated with violence. When violence was presented in the context of alcohol (M = 1.22, SE = .07) the strength of the negative attitude associated with violence was weaker than when violence was presented in the context of recreation (M = 1.41, SE = .07).

Mediational Analysis

The relationship between problem drinking and psychological aggression (CTS2) was not fully mediated by anger (BPAQ). As '*Appendix H'* illustrates, the direct mediation was statistically significant, however, the direct effect between the mediator (anger) and the outcome variable (psychological aggression) was not statistically significant. In Step 1 of the mediational model, regression of psychological aggression (CTS2 subscale) on problem drinking (AUDIT), while ignoring the mediator, was

significant, $a = .28$, $t(114) = 3.20$, $p = .0018$. Step 2 of the model showed that the regression of psychological aggression (CTS2 subscale) scores on the mediator (anger) was not significant, $b = .58$, $t(114) = 1.81$, $p = .0729$. Step 3 of the mediation process showed that the effect of the mediator (anger) on psychological aggression (CTS2), controlling for problem drinking (AUDIT), was significant, $c' = -1.94$, $t(114) = -6.32$, $p < .0001$. The indirect, or mediated, effect was (.28)(.58) = .16. Analyses revealed this relationship was accountable for approximately 24.99% of psychological aggression (CTS2) in the current sample.

The relationship between problem drinking and physical assault (CTS2) was not fully mediated by anger (BPAQ). As '*Appendix I'* illustrates, the direct mediation was statistically significant, however, direct effects between the mediator (anger) and the outcome variable (physical assault) was not statistically significant. In Step 1 of the mediational model, regression of physical assault (CTS2 subscale) on problem drinking (AUDIT), while ignoring the mediator, was significant, $a = .28$, $t(114) = 3.20$, $p = .0018$. Step 2 of the model showed that the regression of physical assault (CTS2 subscale) scores on the mediator (anger) was not significant, $b = 1.00$, $t(114) = 1.82$, $p = .0713$. Step 3 of the mediation process showed that the effect of the mediator (anger) on physical assault (CTS2), controlling for problem drinking (AUDIT), was significant, $c' = -3.18$, $t(114) = -6.25$, $p < .0001$. The indirect, or mediated, effect was (.28)(1.00) = .28. Analyses revealed this relationship was accountable for approximately 26.51% of physical assault (CTS2) in the current sample.

The relationship between problem drinking and sexual coercion (CTS2) was not fully mediated by anger (BPAQ). As '*Appendix J'* illustrates, the direct mediation was

statistically significant, however, direct effects between the mediator (anger) and the outcome variable (sexual coercion) was not statistically significant. In Step 1 of the mediational model, regression of sexual coercion (CTS2 subscale) on problem drinking (AUDIT), while ignoring the mediator, was significant, $a = .28$, $t(114) = 3.20$, $p = .0018$. Step 2 of the model showed that the regression of sexual assault (CTS2 subscale) scores on the mediator (anger) was not significant, $b = .49$, $t(114) = 1.51$, $p = .1315$. Step 3 of the mediation process showed that the effect of the mediator (anger) on sexual coercion (CTS2), controlling for problem drinking (AUDIT), was significant, $c' = -2.43$, $t(114) = -6.58$, $p < .0001$. The indirect, or mediated, effect was (.28)(.49) = .14. Analyses revealed this relationship was accountable for approximately 26.64% of sexual coercion (CTS2) in the current sample.

The relationship between problem drinking and sexual coercion (CTS2) was not fully mediated by physical aggression (BPAQ). As '*Appendix K'* illustrates, the direct mediation was statistically significant, however, direct effects between the mediator (physical aggression) and the outcome variable (sexual coercion) was not statistically significant. In Step 1 of the mediational model, regression of sexual coercion (CTS2 subscale) on problem drinking (AUDIT), while ignoring the mediator, was significant, $a = .37$, $t(114) = 3.49$, $p = .0007$. Step 2 of the model showed that the regression of sexual coercion (CTS2 subscale) scores on the mediator (physical aggression) was not significant, $b = -.14$, $t(114) = -.53$, $p = .5971$. Step 3 of the mediation process showed that the effect of the mediator (physical aggression) on sexual coercion (CTS2), controlling for problem drinking (AUDIT), was significant, $c' = -1.91$, $t(114) = -6.38$, $p < .0001$. The indirect, or mediated, effect was (.36)(-.14) = -.05. Analyses revealed this

relationship was accountable for approximately 25.34% of sexual coercion (CTS2) in the current sample.

Discussion

Although ample research exists regarding the relationship between alcohol use and violence, there is a dearth in the literature investigating this relationship as mediated by other factors, specifically tendencies of aggression. This study proposed two research aims to expand the literature base on potential mediational relationships.

Contrary to previous research, the current study found a significant, negative correlation between problem drinking and IPV as measured by the subscales of the CT2 (Foran & O'Leary, 2008; Graham, Plant & Plant, 2004; White & Chen, 2002; White et al., 2002). Despite this, the current study found that higher problem drinking was associated with greater tendencies of aggression, specifically hostility and anger. As hypothesized, we found that incidences of some forms of IPV, such as injury and sexual coercion, were associated with greater tendencies of some forms of aggression, such as hostility and physical aggression. Consistent with past research on IPV, (Subra et al. 2010; White et al. 2013), higher levels of sexual coercion – a measure of IPV – were highly associated with higher levels of other types of IPV (i.e., psychological aggression, physical assault, and injury).

The current study also investigated the relationship between alcohol and IPV as mediated by tendencies of aggressive behaviors through the use of implicit measures, specifically, two versions of the GNAT. As predicted, regardless of the context in which violent acts were evaluated (i.e., using alcoholic beverages or recreational behaviors as

distractors), violence was more strongly associated with negative attitudes. However, the strength of negative attitude associated with violence was stronger when presented with recreation than when presented with alcohol. In other words, individuals saw violence more negatively in the context of recreational behaviors (as distractors) than in the context of alcoholic drinks (as distractors). This supports the theory that attitude is not a stable construct, but rather one that is susceptible to change dependent upon the context in which it is presented (Obasi et al., under review).

Initial mediational analyses revealed a significant, negative indirect (mediated) link (c') between problem drinking (AUDIT) and psychological aggression (CTS2) when anger (BPAQ) is a mediating factor. Analyses also revealed a significant, negative indirect link (c') between problem drinking (AUDIT) and physical assault (CTS2) when anger (BPAQ) is a mediating factor as well as between problem drinking and sexual coercion when anger was the mediator. When anger (BPAQ) was used as a mediator, a significant negative indirect (mediated) link was found between problem drinking and sexual coercion (CTS2). Likewise, when physical aggression (BPAQ) was used as a mediator, a significant negative indirect (mediated) link was found between problem drinking and sexual coercion (CTS2). This is contrary to prior research that suggests that this relationship should be positive (Foran & O'Leary, 2008; Graham, Plant & Plant, 2004; White & Chen, 2002; White et al., 2002). Furthermore, for all mediational analyses, the link between the mediator (e.g., anger or physical aggression) and the outcome variable (e.g., psychological aggression, physical assault, or sexual coercion) was not found to be significant. This could be due to the ineffectiveness of the measures

used to adequately capture participants' experiences with IPV or problem drinking due the young age of the sample population.

Limitations

Missing data due to experimenter error could have accounted for low alpha levels in some cases. During the preliminary stages of the experiment, some participants did not receive all portions of the study, for instance, data was incomplete due to missing demographic information. Furthermore, participants were obtained through convenient sampling of college students enrolled in Psychology courses via an online database (SONA) with a mean age of 19.66. Because many participants were not of legal drinking age, experiences with alcohol may have been limited. Also, based on mean age of participants, many may not yet have had extensive experience with intimate, romantic relationships. These factors may have influenced the inability of this current study to reveal aggressive tendencies as a significant, *positive* mediating link between alcohol use and IPV. Specifically, in the current sample of college students the concept of sexual coercion (Buss & Perry, 1992) may be different in older populations than in younger ones. Lastly, ego depletion may have caused error in the implicit data due to the lengthy duration of questionnaires administered prior to the completion of GNATs. Ego depletion refers to state of being in which someone does not have access to all normal resources required for functioning and therefore, suffer from impairment in performance and effort (Baumeister and Vohs, 2007; Hagger, Wood, Stiff, & Chatzisarantis, 2010). Counterbalancing implicit computer tasks with questionnaires may have helped account for this potential error.

Future Directions

In light of the limitations of this current study, it would be beneficial to replicate this study in the future. The use of different, shorter measures of IPV may be needed to counteract the effects of possible ego depletion. Furthermore, the AUDIT (Saunders et al., 1993) only screens for the presence of problem drinking. Because of the young nature of the sample population in the current study, it may be beneficial to use a more appropriate measure that gathers information on quantity and frequency of drinking in a population that may not be high in problem drinking due to lack of experience. An adult population over the legal drinking age of 21 may have revealed much different results and could be useful in understanding the relationship under investigation here. Likewise, due to the young nature of the sample, participants may have had only limited experience with intimate, romantic relationships. Therefore, a separate measure of IPV designed specifically for college students may have been beneficial. To our knowledge, this does not yet exist.

In the current study, we did not measure alcohol expectancy. Studies have shown a link between alcohol expectancies and consumption and alcohol related aggression and hostility (Barnwell, Borders & Earleywine, 2007; Borders, Barnwell & Earleywine, 2006; Giancola, Godlaski & Parrott, 2005; Jajodia & Earleywine 2003; Pabst et al., 2014). Specifically, positive implicit associations with alcohol expectancy were able to adequately predict drinking behavior (Jajodia & Earleywine, 2003). Contrary to this, Pabst and collegues (2014) found that for 18 to 24 year olds, a higher negative alcohol expectancy indicated a higher likelihood of alcohol dependency symptoms possibly due to lack of experience with alcohol or preference for drinking environments that contribute

to alcohol related problems. This could explain the difference in results for the current college demographic in relation to adult populations, but we cannot be sure. Therefore, it may be beneficial to measure expectancies alongside other measures of implicit cognition.

Conclusion

Nearly 25% of women and 14% of men in the United States have experienced some form of severe physical violence within an intimate, romantic relationship at some point in their lives. Aside from the physical threat imposed by IPV, victims of partner abuse suffer from other long term mental and health problems such as chronic pain and difficulty sleeping (Black et al., 2011). Because IPV is such a serious and prevalent threat, it is essential to understand the relationship between this form of violence and potential indicators, mediators, and causes. Therefore, the purpose of this study was to expand the existing literature on the relationship between alcohol use and IPV.

Although this study was unable to reveal a statistically significant relationship between these alcohol use and IPV factors with aggression as a mediator, several significant correlations were discovered that are in agreement with past research (Batholow & Heinz, 2006; Borders, Barnwell, & Earleywine, 2007; Freidman, McCarthy, Bartholow, & Hicks, 2007; Foran & O'Leary, 2008; Foran et al. 2008; Pabst et al., 2014; Subra et al., 2010; White et al., 2013). For this current sample of college-aged social drinkers, a correlational relationship between problem drinking scores (AUDIT) and form of both IPV (e. g., sexual coercion and psychological aggression) and forms of aggression (e. g., anger and physical aggression) was found. Analyses of implicit measures of

cognition using the GNAT revealed evidence in support of the theory that states that negative attitudes associated with violence are not static, but are instead relevant to the context in which they are being presented (e.g., recreation or alcohol) (Obasi et al., under review).

This study was unable to reveal a statistically significant, positive mediational relationship between IPV and alcohol use with tendencies of aggressive behaviors. It is possible that this relationship was negative due to sample characteristics and demographics. Results may be different for an older, more experienced population. Though results for mediational analyses were not supported by previous research, support for the relationships between problem drinking and IPV, as well as between problem drinking and tendencies toward aggressive behaviors, was supported. Not only does this study provide a starting point for examining the potential mediating factors within the relationship of IPV and alcohol use, but also insight into the use of implicit measures of cognition in investigating this relationship.

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Appendices

Appendix A

AUDIT Scale Items and Responses

1. How often do you have a drink containing alcohol?

Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week
0	1	2	3	4

2. How many drinks containing alcohol do you have on a typical day when you are drinking?

None	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
0	1	2	3	4	5

3. How often do you have six or more drinks on one occasion?

Never	Less than Monthly	Monthly	Weekly	Daily or Almost Daily
0	1	2	3	4

4. How often during the last year have you found that you were not able to stop drinking once you had started?

Never	Less than Monthly	Monthly	Weekly	Daily or Almost Daily
0	1	2	3	4

5. How often during the last year have you failed to do what was normally expected of you because of drinking?

Never	Less than Monthly	Monthly	Weekly	Daily or Almost Daily
0	1	2	3	4

6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

Never	Less than Monthly	Monthly	Weekly	Daily or Almost Daily
0	1	2	3	4

7. How often during the last year have you had a feeling of guilt or remorse after drinking?

Never	Less than Monthly	Monthly	Weekly	Daily or Almost Daily
0	1	2	3	4

8. How often during the last year have you been unable to remember what happened the night before because of your drinking?

Never	Less than Monthly	Monthly	Weekly	Daily or Almost Daily
0	1	2	3	4

9. Have you or someone else been injured because of your drinking?

No.	Yes, but not in the last year.	Yes, during the last year.
1	2	3

10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?

No.	Yes, but not in the last year.	Yes, during the last year.
1	2	3

Appendix B

Table 1. Procedure for Scoring the AUDIT

	0	1	2	3	4
Question 1	Never	Monthly or less	Two to four times per month	Two to three times per week	Four or more times per week
Question 2	1 or 2	3 or 4	5 or 6	7 to 9	10 or more
Questions 3-8	Never	Less than monthly	Monthly	Weekly	Daily or almost daily
Questions 9-10	No		Yes, but not in the last year		Yes, during the last year

The minimum score (for non-drinkers) is 0 and the maximum possible score is 40.

A score of 8 or more indicates dangerous or harmful alcohol use.

Appendix C

CTS2 (modified) Scale Items

1. I shoved my partner I cared even though we disagreed.
2. My partner showed me that he/she cared even though we disagreed.
3. I showed respect for my partner's feelings about an issue.
4. My partner showed respect for my feelings about an issue.
5. I said I was sure we could work through a problem.
6. My partner said he/she was sure we could work through a problem.
7. I explained my side of a disagreement to my partner.
8. My partner explained his/her side of a disagreement to me.
9. I suggested a compromise to a disagreement.
10. My partner suggested a compromise to a disagreement.
11. I agreed to try a solution to a disagreement my partner suggested.
12. My partner agreed to try a solution to a disagreement I suggested.
13. I insulted or swore at my partner.
14. My partner insulted or swore at me.
15. I shouted or yelled at my partner.
16. My partner shouted or yelled at me.
17. I stomped out of the room or house or yard during a disagreement.
18. My partner stomped out of the room or house or yard during a disagreement.
19. I said something to spite my partner.
20. My partner said something to spite me.
21. I called my partner fat or ugly.
22. My partner called me fat or ugly.
23. I destroyed something belonging to my partner.
24. My partner destroyed something belonging to me.
25. I accused my partner of being a lousy lover.
26. My partner accused me of being a lousy lover.
27. I threatened to hit or throw something at my partner.
28. My partner threatened to hit or throw something at me.
29. I threw something at my partner that could hurt.
30. My partner threw something at me that could hurt.
31. I twisted my partner's arm or hair.
32. My partner twisted my arm or hair.
33. I pushed or shoved my partner.
34. My partner pushed or shoved me.
35. I grabbed my partner.
36. My partner grabbed me.
37. I slapped my partner.
38. My partner slapped me.
39. I used a knife or gun on my partner.
40. My partner used a knife or gun on me.
41. I punched or hit my partner with something that could hurt.
42. My partner punched or hit me with something that could hurt.

43. I choked my partner.
44. My partner choked me.
45. I slammed my partner against a wall.
46. My partner slammed me against a wall.
47. I beat up my partner.
48. My partner beat me up.
49. I burned or scalded my partner on purpose.
50. My partner burned or scaled me on purpose.
51. I kicked my partner.
52. My partner kicked me.
53. I made my partner have sex without a condom.
54. My partner made me have sex without a condom.
55. I insisted on sex when my partner did not want to (but did not use physical force).
56. My partner insisted on sex when I did not want to (but did not use physical force).
57. I insisted my partner have oral or anal sex (but did not use physical force).
58. My partner insisted I have oral or anal sex (but did not use physical force).
59. I used force (like hitting, holding down, or using a weapon) to make my partner have oral or anal sex).
60. My partner used force (like hitting, holding down, or using a weapon) to make e have oral or anal sex).
61. I used force (like hitting, holding down, or using a weapon) to make my partner have sex.
62. My partner used force (like hitting, holding down, or using a weapon) to make me have sex.
63. I used threats to make my partner have oral or anal sex.
64. My partner threats to make me have oral or anal sex.
65. I used threats to make my partner have sex.
66. My partner threats to me have sex.

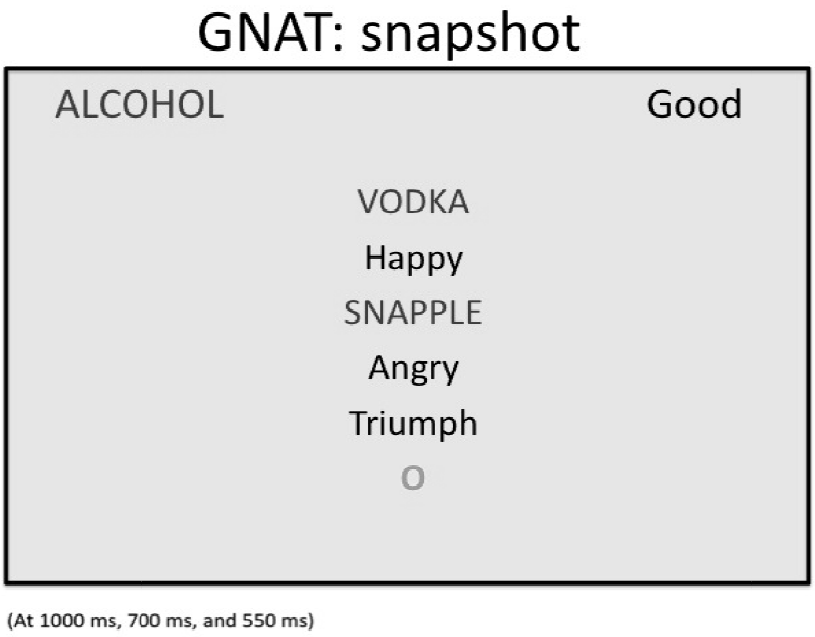
Appendix D

Buss & Perry Aggression Questionnaire Scale Items

1. Once in a while I can't control the urge to strike another person.
2. Given enough provocation, I may hit another person.
3. If somebody hits me, I hit back.
4. If I have to resort to violence to protect my rights, I will.
5. There are people who pushed me so far that we came to blow.
6. I can think of no good reason for ever hitting a person.
7. I have threatened people I know.
8. I have become so mad that I have broken things.
9. I tell my friends openly when I disagree with them.
10. I often find myself disagreeing with people.
11. When people annoy me, I tell them what I think of them.
12. I can't help getting into arguments when people disagree with me.
13. My friends say that I'm somewhat argumentative.
14. I flare up quickly but get over it quickly.
15. When frustrated, I let my irritation show.
16. I sometimes feel like a powder keg ready to explode.
17. I am an even-tempered person.
18. Some of my friends think I'm a hothead.
19. Sometimes I fly off the handle for no good reason.
20. I have trouble controlling my temper.
21. I am sometimes eaten up with jealously.
22. Other people always seem to get the breaks.
23. I wonder why sometimes I feel so bitter about things.
24. I know that "friends" talk about me behind my back.
25. I am suspicious of overly friendly strangers.
26. When people are especially nice, I wonder what they want.
27. I sometimes feel that people are laughing at me behind my back.

Appendix E

Figure 1. Go/No-Go Association Task screenshot.



Appendix F

Table 2. Summary of the Go/No-Go Association Task (GNAT).

Violent Behaviors & Alcohol Go/No-Go Association Task (GNAT- VA)

Sequence		1		2
Task Description	"e" Key	Target 1 + Good Attribute Combined Task	"e" Key	Target 1 + Bad Attribute Combined Task
Task Instructions	* *	VIOLENT BEHAVIORS good	* *	VIOLENT BEHAVIORS bad
Sample Stimuli	*	CHOKE		SCOTCH
		PATRON	*	BURN
	*	smile		cheerful
		dislike		BEER
	*	RAPE		regret
	*	glorious	*	SHOVE
		guilt	*	virtuous
		CORONA	*	wicked

Violent Behaviors & Recreational Activities Go/No-Go Association Task (GNAT- VR).

Sequence		3		4
Task Description	"e" Key	Target 2 + Good Attribute Combined Task	"e" Key	Target 2 + Bad Attribute Combined Task
Task Instructions	* *	VIOLENT BEHAVIORS good	* *	VIOLENT BEHAVIORS bad
Sample Stimuli	*	ASSAULT		lovely
	*	perfect	*	SCRATCH
		HIKING		HOCKEY
		ashamed		celebrate
	*	KILL		SNORKELING
		unpleasant	*	painful
		PAINTING	*	ARGUE
	*	enjoyable	*	destroy

Appendix G

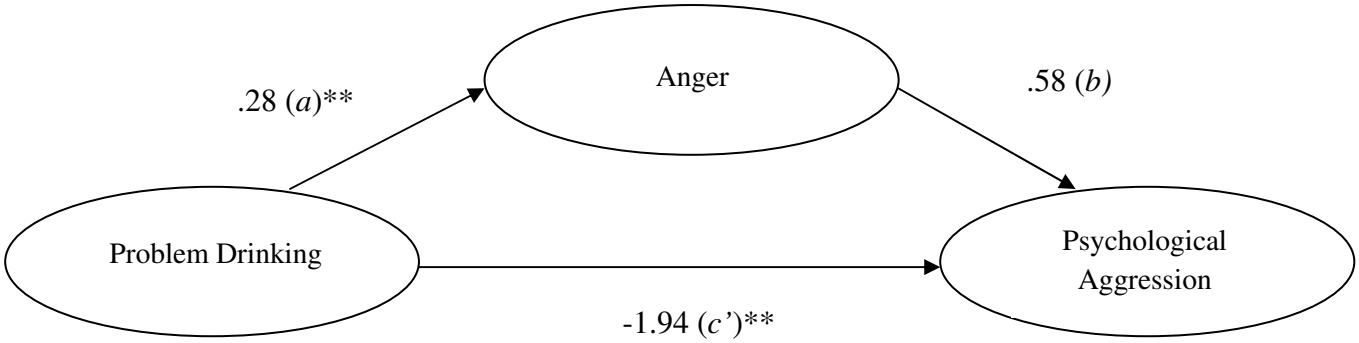
Table 3. Correlations of self-report measures.

Measure	1	2	3	4	5	6	7	8	9
1. Problem drinking	--								
2. Sexual Coercion	-.51**	--							
3. Injury	-.52**	.99**	--						
4. Physical Assault	-.51**	.98**	.97**	--					
5. Psychological Aggression	-.49**	.95**	.93**	.95*	--				
6. Anger	.29**	-.03	.05	-.01	-.00	--			
7. Verbal Aggression	.011	.105	.11	.09	.12	.44**	--		
8. Hostility	.23*	-.19*	-.19*	-.17	-.16	.63**	.23*	--	
9. Physical Aggression	.31**	-.20*	-.20*	-.21*	-.23*	.22*	.38**	.24*	--

Note: * significant at $p < .05$; ** significant at $p < .01$.

Appendix H

Figure 2. Mediational analysis of the relationship between problem drinking and psychological aggression as mediated by anger.

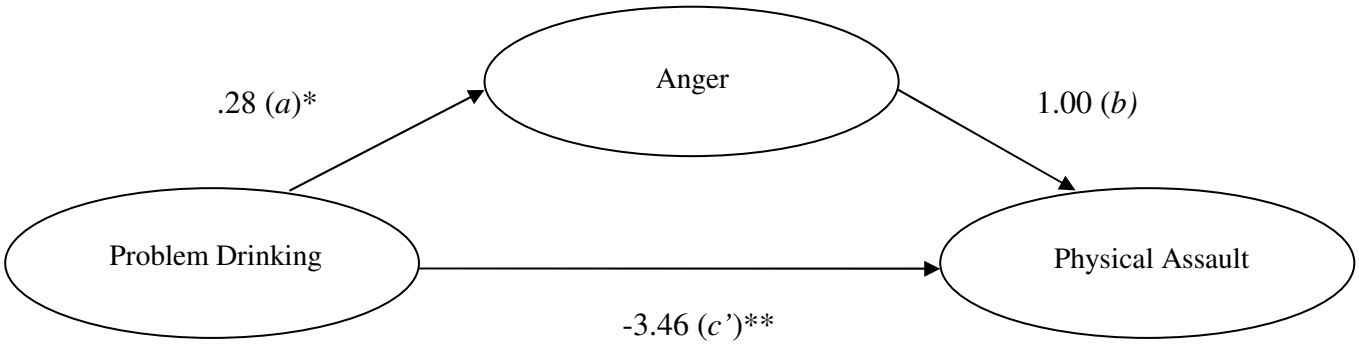


Note: * significant at $p < .05$; ** significant at $p < .01$.

a) Path of direct effect of independent variable (IV) on mediator (M).
b) Path of direct effect of M on outcome variable (DV).
c') Path of direct effect of IV on DV when accounting for M.

Appendix I

Figure 3. Mediational analysis of the relationship between problem drinking and physical assault as mediated by anger.

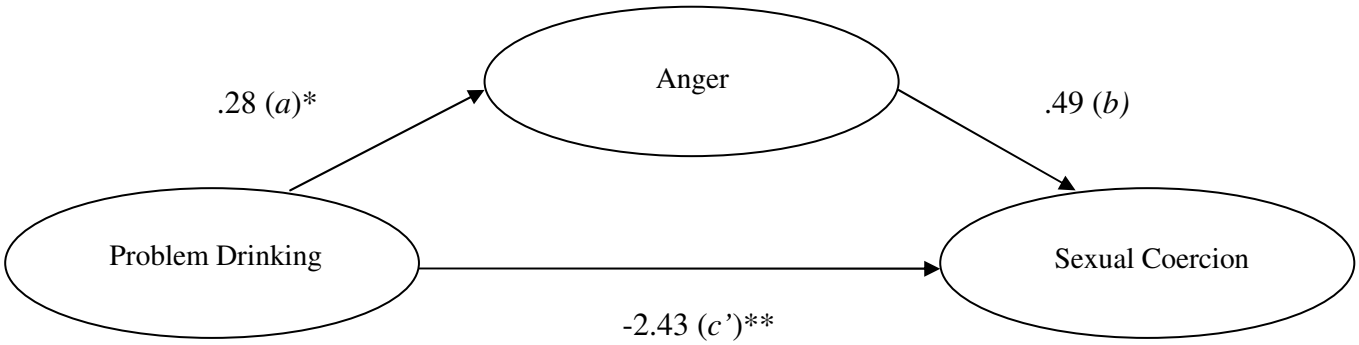


Note: * significant at $p < .05$; ** significant at $p < .01$.

a) Path of direct effect of independent variable (IV) on mediator (M).
b) Path of direct effect of M on outcome variable (DV).
c') Path of direct effect of IV on DV when accounting for M.

Appendix J

Figure 4. Mediational analysis of the relationship between problem drinking and sexual coercion as mediated by anger.

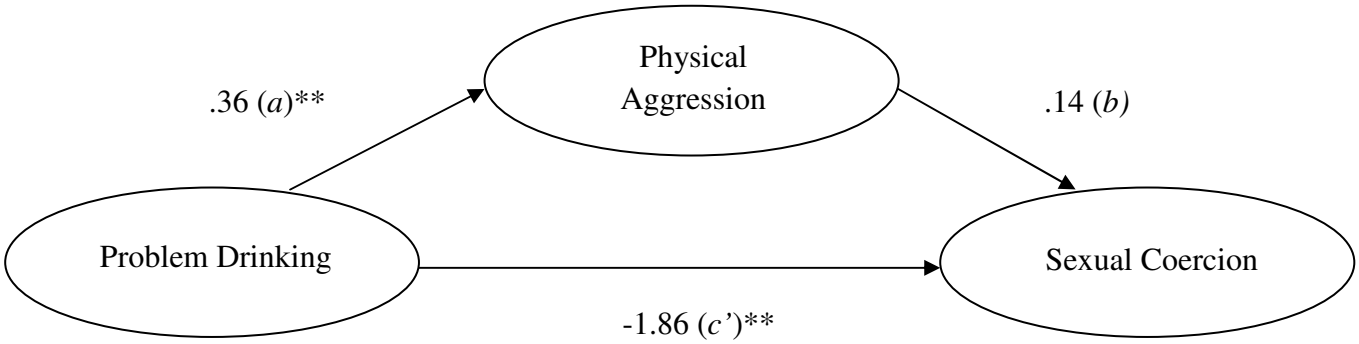


Note: * significant at $p < .05$; ** significant at $p < .001$.

a) Path of direct effect of independent variable (IV) on mediator (M).
b) Path of direct effect of M on outcome variable (DV).
c') Path of direct effect of IV on DV when accounting for M.

Appendix K

Figure 5. Mediational analysis of the relationship between problem drinking and sexual coercion as mediated by physical aggression.



Note: * significant at $p < .05$; ** significant at $p < .001$.

a) Path of direct effect of independent variable (IV) on mediator (M).
b) Path of direct effect of M on outcome variable (DV).
c') Path of direct effect of IV on DV when accounting for M.

Appendix L

Figure 6. Negative implicit cognitions associated with 'Violence' within Different Contexts (e.g., 'Recreation' and 'Alcohol').